— *Working Group Session Summary* —

Towards Standards for Goal-Based Operations

Session 10A

Daniel Dvorak, Richard Morris
Jet Propulsion Laboratory
California Institute of Technology

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Presenters/Panelists

Daniel Dvorak (chair)
- Principal Engineer: Planning & Execution Systems
  Jet Propulsion Laboratory, California Institute of Technology

John Gersh
- Principal Engineer: Human-Computer Interaction,
  System and Information Sciences Group
  Applied Physics Laboratory, The Johns Hopkins University

Mitch Ingham
- Senior Engineer: Flight Software Systems Engineering & Architectures
  Jet Propulsion Laboratory, California Institute of Technology

Andrew Rowland
- Project Engineer, WGS Mission Integration
  The Aerospace Corporation

Bonnie Triezenberg
- Software Chief Engineer, Boeing Satellite Development Center

What is Goal-Based Operations?

- Variously called…
  - Policy-based management
  - Activity-based operations
  - Directive-based commanding
  - Goal-based operations (GBO)
- Common themes
  - Explicit representation of operator *intent*
  - Expresses *what* not *how*
  - Inherently closed-loop control

Session Goals

- Build a community of interest in GBO
- Raise awareness of motivations and benefits of GBO
- Identify issues and start a dialogue leading to standards

Key Points

- GBO moves beyond limitations of command-based sequencing
- GBO can be viewed as a management layer on top of the control system
- GBO enables more autonomous operation

Why do we need GBO?

- System complexity…too many states for an operator to keep track of
  - Reduce human error
  - Allow operators to focus on big picture
- Mission requirements no longer satisfied with "run to safe-mode"
  - More effective use of expensive assets in the presence of intermittent/infrequent communications
- Interoperability of multiple assets
- Human-robotic interaction

What are the challenges?

- Making it concrete for managers
- V&V
- Adaptation of legacy tools
- Cultural hurdles

Why do we need standards?

- Interoperability for coordinated spacecraft
- Programs with assets developed by multiple agencies
- Common terminology
- Focus the community

What do we standardize for GBO?

- Goal representation
- Operations processes and tools
- Software architecture
- V&V techniques
- Human Machine Interface

Conclusions

- The concepts of GBO are appearing in several places
- We need standards...to achieve interoperability and avoid stovepipes
- We are engaging several standards organizations (CCSDS, TOG, OMG)
- We need to start defining terms and promote a dialogue with the larger community

Next Steps

- Set up a working group with TOG (The Open Group)
- Investigate Space Domain Task Force at OMG (Object Management Group)
- Submit paper and/or working group proposal to GSAW 2007
- Set up web site and mailing list